

Claims:

What is claimed is:

1. A method of making quantum size effect micro particles, characterized in that it comprises the steps of:

introducing silane into a VHF-band plasma of argon while controlling the time duration in which the silane is so introduced to form Si single crystal micro particles with their particle size controlled;

forming on a substrate a layer of such Si single crystal micro particles so formed; and

converting respective surface areas of said Si single crystal macro particles in said layer on said substrate into insulating films.

2. A method of making quantum size effect micro particles as set forth in claim 1, characterized in that the step of forming Si single crystal micro particles comprises:

forming  $\text{SiH}_2$  radical,  $\text{SiH}_3$  radical and  $\text{SiH}_n^+$  ions (where  $n = 0$  to 3) in said VHF-band plasma of argon;

forming nuclei of said Si single crystal micro particles from the  $\text{SiH}_2$  radical; and

bonding the  $\text{SiH}_3$  radical and  $\text{SiH}_n^+$  ions (where  $n = 0$  to 3) to said nuclei to cause the latter individually to crystallographically grow, thereby forming the Si single crystal micro particles.

3. A method of making quantum size effect micro particles as set forth in claim 1, characterized in that the step of forming a layer of Si single crystal micro particles on a substrate comprises causing the Si single crystal micro particles to diffuse following a concentration gradient thereof, followed by their arrival to and deposition on said substrate, forming there said layer thereof.

4. A method of making quantum size effect micro particles as set forth in claim 1, characterized in that the step of converting respective surface areas of said single crystal macro particles in said layer on said substrate into insulating films comprises exposing said Si single crystal micro particles to a gas atmosphere of  $\text{O}_2$  or  $\text{N}_2$  to oxidize or nitrify the respective surface areas thereof.

5. A method of making quantum size effect micro particles as set forth in claim 1, characterized in that the step of converting respective surface areas of said single crystal micro particles in said layer on said substrate into insulating films comprises exposing said Si single crystal micro particles to a gas plasma of O<sub>2</sub> or N<sub>2</sub> to oxidize or nitrify the respective surface areas thereof.

6. A method of forming layers of quantum size effect particles, characterized in that it comprises repeating a process comprising steps as set forth in claim 1.

7. A method of making quantum size effect micro particles as set forth in claim 1, characterized in that it further comprises controlling the particle size of said Si single crystal micro particles by controlling the time duration in which silane is introduced into said VHF-band plasma of argon.